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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,489	02/17/2004	Victor W. Logan	GP-303714	1549

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CARY W. BROOKS  
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EXAMINER
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MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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05/04/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/780,489	<b>Applicant(s)</b> LOGAN, VICTOR W.	
	<b>Examiner</b> Julian Mercado	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☒ Claim(s) 6, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>2004-02-17</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The Information Disclosure Statement (IDS) filed on February 17, 2004 has been considered by the examiner.

Claims 1-29 are pending.

### ***Claim Objections***

Claims 6, 8 and 9 are objected to because of the following informalities:

1. In claim 6 at line 3, it is suggested to delete "Is this too specific?"
2. In claim 8 at line 2, it is suggested to change "equation" to --equations--.
3. Claim 9 in the last line of the claim recites the limitation "~~total~~ anode pressure".

It is suggested to resubmit claim 9 with the proper claim identifier "(currently amended)", in order for the term "total" to be properly stricken from the claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 29 recites the limitation "said dilution gas" in lines 9 and 11. There is insufficient antecedent basis for this limitation in the claim (both instances).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-19, 24, 25 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Mizumoto et al. (U.S. Pat. 4,904,547).

For claims 1, 18, 19, 24, 25 and 27-29, Mizumoto et al. teaches a fuel cell stack comprising a plurality of electrochemical fuel cells each having a membrane electrode assembly [2] between an anode flow field and a cathode flow field, "a fuel cell stack 2 furnished with inlet and outlet manifolds for fuel and air." (col. 1 lines 16-18) A first reactant supply such as air/oxygen and a cathode flow field exhaust is in communication with the cathode flow field, and a second reactant supply such as fuel and an anode flow field vent valve [4] is in communication with the anode flow field. See Figure 2 and col. 2 line 3 line 5 et seq. A condition monitor, such as pressure detector [14], is configured to generate a signal indicative of a condition of a component of said fuel cell, such as the pressure of the anode side of the stack. See col. 3 line 31 et seq. A vent valve controller [13] controls an operating state of the vent valve, as found in col. 3 lines 31-38.

The differential pressure fluctuations are respectively detected by the first and second differential pressure detectors 14 and 16, and the first and second pressure controllers 13 and 15 respond to

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the detection signals and control the opening degrees of the differential pressure control valves 4 and 6 so as to cancel the differential pressure fluctuations respectively.

Note that a second condition monitor [16] is similarly disclosed, which also generates a signal indicative of a condition of the cathode side of the stack.

As to the controller being programmed to control a function of the condition signal and a calculated dilution gas crossover rate or dilution gas concentration of the membrane electrode assembly, while features of an apparatus may be recited either functionally or structurally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In similar fashion, claim 14 recites the control being by way of the functional limitation of integration of the crossover rate to yield a molar fraction calculation of the dilution gas in the anode flow field, claim 15 recites that the controller is programmed to calculate an aggregate dilution gas concentration in said anode flow field, while claim 17 recites the functional limitation of controlling the operating state of the vent valve independent of an operating output voltage of the fuel cell, output voltage statistics, cell voltage decay, and its combinations. It is further noted that the vent valve is claimed as being configured to enable the vent valve controller to monitor and control the operating state of the vent valve (claim 18) or being configured to enable the vent valve controller to monitor and control an amount of gas passing through the vent valve (claim 19). Accordingly, the limitations drawn to the control being a function of the condition signal, calculated dilution gas crossover rate, integration of a crossover rate, or aggregate dilution gas concentration, along with the limitations drawn to the vent valve being configured in the specified manner, have not been given patentable weight, as these limitations are *functional limitations* and thus fail to further limit the claimed device or apparatus by merely reciting limitations of intended use. It has been held that a recitation with

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respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus which otherwise satisfies the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

Claims 2-13 and 16 recite limitations drawn to the particulars of the vent valve operating conditions and its methods and modes of operation. Accordingly, these limitations (while considered by the examiner) have not been given patentable weight, as they fail to further limit and give patentable scope to the claimed device.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizumoto et al. (U.S. Pat. 4,904,547) in view of Dipierno Bosco et al. (U.S. Pat. 6,103,409).

The teachings of Mizumoto et al. are discussed above.

Mizumoto et al. does not explicitly teach a data store in communication with the vent valve controller. However, Dipierno Bosco et al. teaches a data store [42] in communication with a controller [54]. See col. 4 line 47 to col. 5 line 36. At the time the invention was made, the skilled artisan would have found obvious to modify Mizumoto et al.'s invention by employing a data store. The motivation to do so would be to allow for signal collection and subsequent processing of its information, e.g. converting analog signals from operational

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parameters, such as pressure, into digital form for system calculation. (ib.) In applying this ground of rejection, the examiner notes that limitations drawn to what the data store may incorporate or comprise (while considered by the examiner) have not been given patentable weight, as such language is construed as a statement of intended while not further limiting the claim to a particular structure.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizumoto et al. (U.S. Pat. 4,904,547) in view of Takada et al. (U.S. Pat. 5,460,896).

The teachings of Mizumoto et al. are discussed above.

Mizumoto et al. does not explicitly teach a vehicle with the claimed fuel cell as a source of electrical power. However, Takada et al. teaches vehicles with fuel cell power plants. See col. 1 lines 13-27. The skilled artisan would find obvious to employ the fuel cell of Mizumoto et al. in a vehicle, in view of its "achieved lightweighting and reduced space...." (ib.)

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat 5,059,494 to Vartanian et al. is cited to teach a gas crossover rate, i.e. a "cross cell pressure differential". See col. 1 line 36 et seq. and col. 3 line 43 et seq.

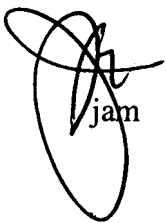
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER